

WHAT IS CLAIMED IS:

1. A chimeric molecule comprising a polypeptide having telomerase catalytic activity fused to a telomere binding polypeptide.
2. The molecule according to claim 1 wherein said polypeptide having telomerase catalytic activity comprises the catalytic protein subunit of telomerase reverse transcriptase, or functional portion or variant thereof.
3. The molecule according to claim 2 wherein said telomerase reverse transcriptase is a mammalian telomerase reverse transcriptase, or functional portion or variant thereof.
4. The molecule according to claim 1 wherein said telomere binding polypeptide is selected from the group consisting of Pot1, TRF1, TRF2, PinX1, Rap1, Tin2, Tankyrase, TANK2 and Ku70/80, and functional portions and variants thereof.
5. The molecule according to claim 4 wherein said telomere binding polypeptide is human Pot1 (hPot1), or functional portion or variant thereof.
6. The molecule according to claim 1 wherein said telomere binding polypeptide is present in said

molecule N-terminal to said polypeptide having telomerase catalytic activity.

7. The molecule according to claim 1 wherein said telomere binding polypeptide is directly linked to said polypeptide having telomerase catalytic activity.

8. A nucleic acid sequence encoding the molecule according to claim 1.

9. The nucleic acid sequence according to claim 8 wherein said nucleic acid sequence encodes a molecule comprising the protein encoded by the nucleotide sequence set forth in SEQ ID NO:1, or functional portion or variant thereof.

10. The nucleic acid sequence according to claim 8 wherein said nucleic acid sequence comprises the nucleotide sequence set forth in SEQ ID NO:1.

11. An expression construct comprising said nucleic acid sequence according to claim 8 operably linked to a promoter.

12. A vector comprising the nucleic acid sequence according to claim 8.

13. The vector according to claim 12 wherein said vector is a viral vector.

14. The vector according to claim 13 wherein said viral vector is a retroviral vector, adeno-associated viral vector, lentiviral vector or adenoviral vector.

15. A liposome comprising the nucleic acid sequence according to claim 8.

16. A composition comprising the nucleic acid sequence according to claim 8 encapsulated in a polymer.

17. An isolated cell comprising the nucleic acid sequence according to claim 8.

18. The cell according to claim 17 wherein said cell is a stem or progenitor cell.

19. The cell according to claim 17 wherein said cell is an epithelial cell or a fibroblast.

20. The cell according to claim 17 wherein said cell is a muscle cell, nervous system cell, or keratinocyte.

21. The cell according to claim 17 wherein said cell is a human cell.

22. The cell according to claim 17 wherein said cell is immortal.

23. A method of producing a protein comprising culturing said cell according to claim 17 under conditions such that said nucleic acid sequence is expressed and said molecule is thereby produced.

24. A method of elongating telomere length comprising introducing into a cell the nucleic acid sequence according to claim 8 under conditions such that said nucleic acid sequence is expressed and said molecule is thereby produced and said elongation is effected.